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DEPARTMENT OF NOTES AND REVIEWS

It is the purpose, in this department, to present from time to time brief original notes, both of methods of work and of results, by members of the Society. All members are invited to submit such items. In addition to these there will be given a few brief abstracts of recent work of more general interest to students and teachers. There will be no attempt to make these abstracts exhaustive. They will illustrate progress without attempting to define it, and will thus give to the teacher current illustrations, and to the isolated student suggestions of suitable fields of investigation.—[Editor.]

METHODS FOR STUDYING LIVING TREMATODES

Studies on the living animal are of great importance in morphological work on the Trematoda. Such studies have been entirely neglected by most workers on the group. I believe that an increased use of living material in the study of trematodes will make it possible to advance the knowledge of the group more rapidly and to avoid many errors. Material of living larvae and adult trematodes is easily obtained for class use, and its use adds greatly to the students' interest. Abundant material of sporocysts, rediae and cercariae can usually be obtained by the examination of freshwater snails and material for the study of adults from the intestines or lungs of frogs or snakes.

In miracidia or cercariae careful studies on locomotion reveal interesting specific characters, which may give hints of the type of host in which further development is carried on. The power of extension and contraction is so great in most trematodes, especially in larval stages, that a true conception of size and shape can be only gained from the living animal. The pattern of the excretory system can only be made out from living material. In fact it is almost impossible without careful studies in the living condition to define sufficiently the structure of a cercaria to insure specific determination. The amount of detail of structure which can be quickly obtained from the study of living trematodes is often surprising. In one small distome about 2 mm. in length it was possible from one living specimen not only to work out the connections of the reproductive ducts and to gain some idea, from the direction of the beat of the cilia, of the functioning of the parts, but also to make a camera lucida drawing under the oil immersion of the connections of the female ducts.

Agamodistomes and adults for live study should be transferred to slides in normal saline solution and covered with thin cover glasses.

The water should be slowly removed from the preparation with a piece of blotting paper until the pressure of the cover glass slightly flattens the fluke without injuring any of its structures. Such a preparation, when carefully sealed with vaseline, will often remain a whole day in perfect condition for study and can be examined even with an oil immersion lens. Sporocysts, rediae and cercariae are usually found in large numbers in the digestive gland of the gasteropod host. The fully developed cercariae should be mounted for study in the water from which the snails are obtained, and the sporocysts, rediae and immature cercariae in normal saline. By slowly removing the water from beneath the cover glass with blotting paper, cercariae so small that they are almost invisible to the naked eye can be slowed down and flattened so that they can be studied under the highest powers of the microscope. When dealing with small forms it is easier to make new mounts as the one being studied becomes too dry, than it is to try to make a preparation more permanent.

At every stage of compression different structures are brought out. Just before a cercaria goes to pieces in the process of drying the smaller tubules of the excretory system are distended and the movements of the flame-cells accentuated, so that they become clearly visible. By careful observations and the use of a number of preparations the number and position of the flame-cells and the relation of the tubules can be gradually traced until the whole pattern of the excretory system is understood and recorded. By this method I have been able to work out the excretory systems of miracidia, rediae, agamodistomes and small adult trematodes. The pattern of one system containing one hundred and twenty flame-cells was successfully solved. I know of no other way by which such a complicated excretory system could be worked out. The compound binocular microscopes recently put on the market have proven very helpful in the type of studies described above. This instrument is easy on the eyes and gives depth to the object observed. Several intra vitam stains have been tried. So far no method of intra vitam staining has been found which gives a better picture than the unstained animal.

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